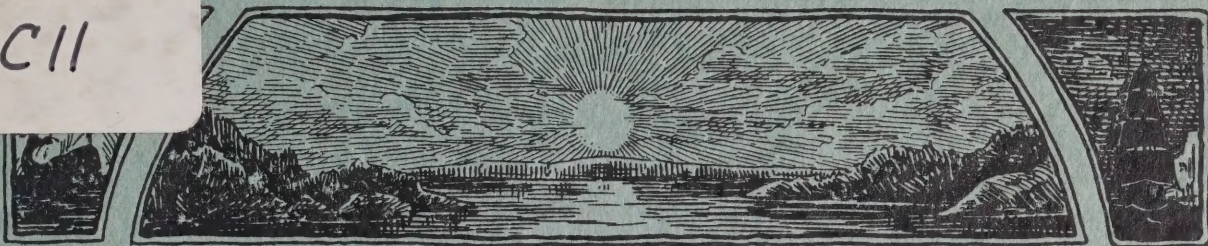


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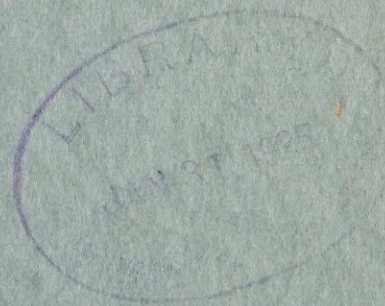


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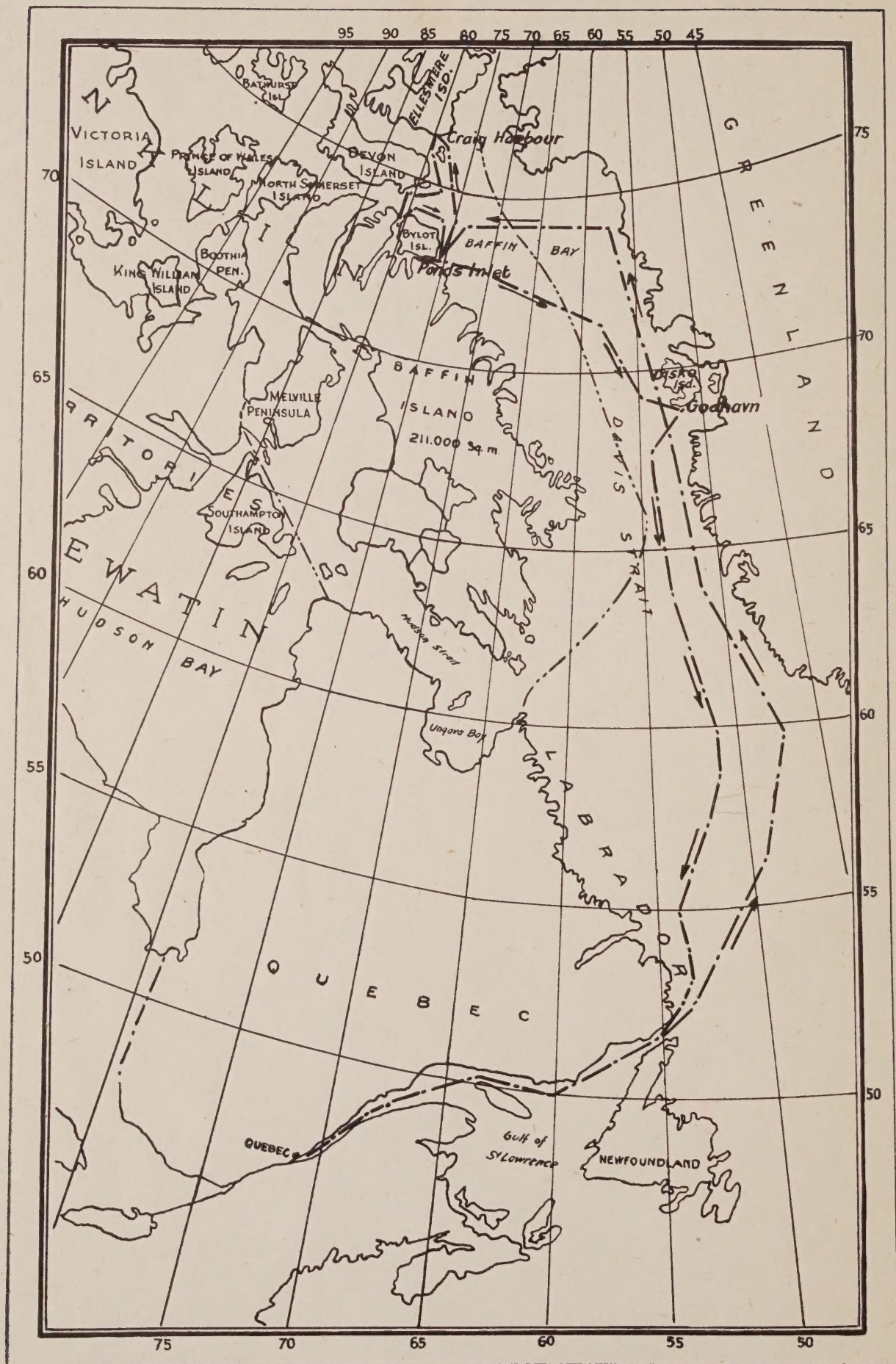
CANADA'S ARCTIC ISLANDS

Log of Canadian Expedition

1922



F. A. ACLAND
Printer to the King's Most Excellent Majesty
Ottawa
1923



Track of the G.G.S. Arctic, 1922 shown thus - - -

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CANADA'S ARCTIC ISLANDS
LOG OF CANADIAN EXPEDITION
1922

By J. D. CRAIG, B.Sc., D.L.S., M.E.I.C.
International Boundary Commission

WITH AN APPENDIX
AVIATION IN THE ARCTIC

By MAJOR R. A. LOGAN
Department of National Defence



F. A. ACLAND
Printer to the King's Most Excellent Majesty
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CANADA'S ARCTIC ISLANDS

The C. G. S. "Arctic" Expedition During 1922

BY J. D. CRAIG

One of the greatest, possibly the greatest, of Canada's unexploited treasures of natural resources may develop in that region known as the Arctic archipelago, which lies north of the mainland of the North American continent and to the westward of Greenland. While this whole region is ordinarily looked on as a vast, icebound, inhospitable, and barren waste, the Canadian Government has been sending occasional expeditions to explore and report upon it and gradually the amount of information available concerning it is increasing. Just as Alaska, years ago, was considered by the majority of people to be practically valueless, so there is even to-day a strong belief in many quarters that our northern islands have practically no economic value. Alaska, however, has proved to be a source of no inconsiderable revenue, as had been foreseen by those who were instrumental in promoting its purchase by the United States, and to-day those who have had the opportunity of analyzing the data on file about our northern islands believe that some day, possibly in the not too distant future, our little known far northern districts will prove to be more than merely a source of interest to the explorer, the big game hunter, and the trader.

The islands of the Arctic archipelago extend from the north side of Hudson bay and Hudson strait, in 62 degrees north latitude, to 83 degrees north latitude, a distance of 1,500 miles. Their greatest extension westward is along the 73rd parallel, from the west side of Baffin bay to 125 degrees west longitude, a distance of 500 miles.

Following is a list, subject to corrections, of the islands having an area greater than 500 square miles, with their approximate areas: (a)

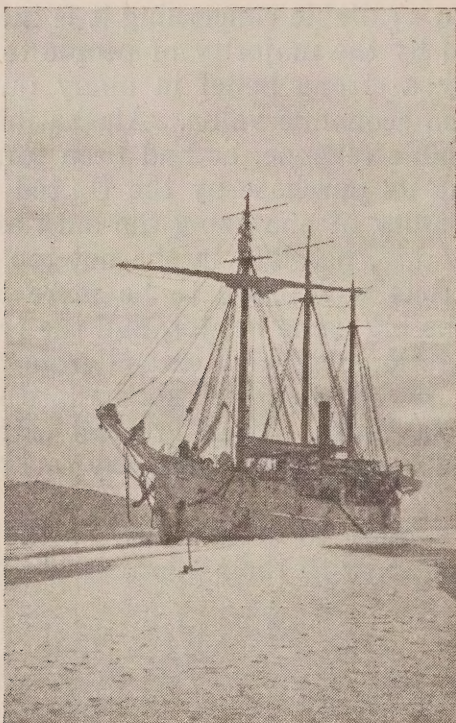
	Area square miles
Southampton.. . . .	19,100
Baffin.. . . .	211,000
Bylot.. . . .	5,100
North Somerset.. . . .	9,000
Prince of Wales.. . . .	14,000
King William.. . . .	6,200
Victoria.. . . .	74,400
Banks.. . . .	26,400
North Devon.. . . .	21,900
Ellesmere.. . . .	76,600
Axel Heiberg.. . . .	13,200
Cornwallis.. . . .	2,700
Bathurst.. . . .	7,000
North Cornwall.. . . .	600
King Christian.. . . .	2,600
Amund Ringnes.. . . .	2,200
Ellef Ringnes.. . . .	4,800
Eglinton.. . . .	700
Melville.. . . .	16,200
Prince Patrick.. . . .	7,100
	520,800

(a) The above list does not include islands reported by Canadian Arctic Expedition, 1913 to 1918.

This, it might be pointed out, is slightly greater than the combined areas of Alberta and Saskatchewan.

THE EXPEDITION OF 1922

In line with the policy of the Government, and continuing the work inaugurated years ago when expeditions were sent north under Commander A. P. Low and Captain J. E. Bernier, the Department of the Interior, through its North West Territories Branch, organized an expedition in 1922, and the result was the establishment of police posts, customs houses, and post offices at various points throughout the North, the intention being to establish additional similar posts from year to year until there is assurance that Canadian laws and regulations will be well administered in the regions controlled by these outposts of civilization.



Steamer "Arctic" in ice, Ponds Inlet.

Certain facts brought out in 1920 by the investigations conducted by the Reindeer and Musk-Ox Commission impressed upon the Government the necessity of taking immediate steps to protect both the natives and the big game in the far north. Trading companies, British and foreign, were establishing posts and sending expeditions into that region, and it seemed expedient to have the Canadian Government represented on the ground by members of the Royal Canadian Mounted Police.

It was at first intended to send an expedition north in 1921, but this was later abandoned. Captain H. C. Pickels, of Mahone Bay, Nova Scotia, was appointed in command of the ship *Arctic* upon her transfer from the Department of Marine and Fisheries late in 1920. Captain Pickels had had long experience in northern navigation and came highly recommended by Dr. W. T. Grenfell, of Labrador fame. He had immediate charge of all work in connection with the repair and outfitting of the ship from the time of his appointment until his regrettable and very sudden death on October 1, 1921. During his comparatively

short connection with the Department, he had endeared himself to all by his cheery good will and by his devotion to his work, and his untimely demise was much regretted.

The ship remained in winter quarters until June, 1922, when Captain J. E. Bernier, who had been appointed to succeed Captain Pickels, took command. Captain Bernier's previous experience in the north, both on Government expeditions, when in command of the *Arctic* on some of her previous voyages, and on private enterprises in command of a ship of his own, made him a peculiarly valuable official for the Government from every point of view and the experience of the past season showed that their confidence in him had not been misplaced.

On June 9 instructions reached the North West Territories Branch to go ahead with the work so that it was only by the very closest kind of co-operation between the Department of Marine and Fisheries, the Royal Canadian Mounted Police and the Department of the Interior that the expedition was enabled to sail from Quebec on July 18.

The writer had the honour of being chosen as Officer in Charge of the Expedition, the duties of this office also including the general supervision of all repair work in connection with the ship and purchasing of supplies for the voyage.

The C.G.S. *Arctic* had been for several years in the lightship service under the Department of Marine and Fisheries, acting in that capacity during the season of navigation at the Lower Traverse below Quebec. By Order in Council she was transferred to the control of the Department of the Interior for the purposes of the expedition, the understanding being that the work in connection with the refitting and outfitting should be done by the Department of Marine and Fisheries at Quebec and should be paid for at cost by the Department of the Interior. The Police were to purchase their own supplies and outfits, including lumber and other material for their quarters, the Department of the Interior, through the C.G.S. *Arctic*, merely acting as transportation agent to carry police personnel and supplies to the sites selected for the posts.

The hurry and bustle and more or less orderly confusion around the ship may be better imagined than described. It was some few days after June 9 when matters really got well under way, and when it is considered that between that time and July 18, when the expedition sailed, boilers and engines were overhauled, sails bent on, the interior and exterior of the ship painted and supplies for forty-five men for sixteen months, police equipment, and supplies for their men for two years, six hundred and fifty tons of coal and three and a half car loads of lumber were purchased, assembled, and loaded aboard the ship, the wonder is that after getting away from Quebec, and settling down to the ordinary routine of a sea voyage, many articles were not found to have been either forgotten or stowed in some forgotten spot, or so as to be inaccessible when needed. Such, however, was not the case, and surprisingly few occasions arose when any article legitimately needed could not be produced almost immediately.

An unsuccessful attempt was made to have an aeroplane and aviator accompany the expedition, but, after many consultations and much correspondence with the Air Board, this was abandoned, the necessary funds not being available. An arrangement was, however, effected by which a representative of the Air Board accompanied the expedition as observer. The expedition was fortunate in having Major R. A. Logan appointed as the Air Board's representative. Besides being a qualified aviator, he is a Dominion Land Surveyor and a Nova Scotia Land Surveyor. He had taken a special course in meteorology with particular reference to aviation, and in addition was well up in wireless work, having developed a small portable radio set for use in the field by surveyors and others desirous of getting correct time for observation purposes.

Mr. L. O. Brown, D.L.S., of the Geodetic Survey, accompanied the expedition as surveyor, with Mr. Thomas P. Reilly, of the International Boundary

Surveys Branch, as assistant. Their duties were to survey such posts as might be established, and to map, topographically, as much of the surrounding country as possible. Mr. Brown also acted as meteorological observer during the trip.

Dr. L. D. Livingstone, of Douglas, Ontario, and late of St. Luke's Hospital, Ottawa, was appointed medical officer of the expedition; Mr. W. H. Grant of the Canadian National Railways, secretary, and Mr. George H. Valiquette of Ottawa, cinematographer.

Much consideration was given to the question of having geologists, mineralogists, and other scientists accompany the expedition, and while it was realized that it was very desirable to make every effort to secure scientific information such as they might collect, at the same time it hardly seemed good policy to occupy three or three and a half months of the valuable time of these men for the sake of the information they would be able to secure during the total of the six or eight, or possibly ten, days they would be ashore during the voyage. It is hoped that it may be possible to use as bases of operation the posts established in 1922 and those to be established in the future, so that trained scientific observers may be able to remain in the north throughout at least a year, and that in this way there will be rapidly acquired that detailed and accurate knowledge concerning the country which is so necessary to its future development. There is great need also of that intensive examination which a region receives only from the prospector. If some means can be found of inducing the prospector to take an interest, we may hope to see speedily a real development of its natural resources, as there is every reason to believe that, with the many indications of the presence of minerals of various kinds, some one, or more, of these will be found to be of real economic importance.

It may be of interest here to quote from a report prepared by an officer of the Geological Survey regarding the possibilities of the mineral resources of the archipelago:—

“It is the duty of the geologist to map in such detail as is consistent with the time allotted to the work, the different geological formations and to report on their lithological characters, structural and age relations. He does not engage in prospecting for minerals. He points out the different areas where geological conditions exist that are favourable to the occurrence of minerals. It is the prospector who searches for minerals and serves as the real pioneer of the mineral industry. In this work he relies on the geological maps and reports to direct him to the localities where his work is most likely to be successful.

“Because of the lack in the Arctic islands of the close intensive work of the prospector little is known yet about the economic minerals. Our knowledge of the geological features, however, enables us to say that the possibilities of the occurrence of large and valuable deposits of minerals are worthy of very careful consideration. Geological formations are found in these islands similar to those in which economic minerals of great importance occur in the southern part of Canada and in the United States.”

After mentioning coal, a good quality of which has been found in many localities, and also lignite, bituminous shale, copper, graphite, gypsum, iron, mica, and some of the precious metals, the report goes on:—

“It is not suggested that all or any large number of these minerals will be found, but it seems probable that prospecting of the pre-Cambrian rocks would lead to the discovery of one or more in commercial quantities. Graphite and mica have been mined on Baffin land and crysolite on Greenland.

“It is only in very recent years that the discovery of the rich ore bodies of Sudbury, Cobalt, and Porcupine has revealed to Canada the

latent mineral possibilities of her vast northland. Even now the public is beginning to direct its attention to the mineral possibilities of the Arctic islands, and inquiries regarding the same are received at the Department of Mines."

THE START FOR THE NORTH

After five weeks of feverish activity inside and out, the ship, on the evening of July 17, appeared ready for sea. Her cargo was on board and stowed: 500 tons of coal for ship's fuel; 150 tons for use of police posts for two years; 225 tons of lumber for the police buildings; 75 tons of cargo, consisting of police equipment and stores for two years, and supplies for the ship's crew for sixteen months in case she should be frozen in over the winter—a grand total of 950 tons. The lumber loaded on the ship was sufficient for only three posts, though it had been hoped to be able to establish four during the season. As it was, however, the ship had an enormous deckload and it was absolutely impossible to carry any more equipment or supplies. It may be noted here that the ship as loaded at Quebec was drawing twenty feet forward and twenty feet, six inches, aft.

About eleven o'clock on the evening of July 17 the engines turned over under their own steam for the first time in several years and at 5.45 o'clock the following morning, without any trial trip or any further delay, the ship left the King's wharf at Quebec, where she had been lying during the outfitting and loading, and started on her voyage.

The ship left the dock primarily to have her compasses adjusted in the harbour by the Government inspector, but in reality on the first leg of her summer's voyage, a voyage which might easily be extended to eighteen months, if the ship should be caught in the ice.

On board were the police party consisting of Inspector Wilcox and nine men; the ship's five officers and crew of twenty men under Captain Bernier; the ship's doctor, the representative of the Air Board, the surveyor and assistant surveyor, the cinematographer, the officer in charge and his secretary—a grand total of forty-three souls.

After the adjustment of the compasses had been completed to the satisfaction of the Inspector, the Captain ordered all sails set, as there was a fair wind blowing, and under both sail and steam the *Arctic* left Quebec in the midst of the farewell salutes by the whistles and sirens of most of the craft in the harbour.

The first result of the hurried departure and of the omission of the trial trip, was the blowing out of a water-gauge glass on the boiler which occurred just after the ship left the dock. This necessitated the "blowing" of the boiler so that the glass could be replaced and also the hiring of tugs to manœuvre the ship while the compasses were being adjusted. Shortly after setting underway down the river another gauge glass gave away under the pressure of the steam, the flying glass this time cutting the face of the chief engineer who happened to be passing at the instant. Sails had to be lowered and the anchor dropped, while the boiler was "blown" again and repairs were made. These two instances were only the forerunners of a series of minor accidents, such as packings blowing out, valves cracking, and babbit "burning out," most of which could be traced to the extremely hurried outfitting. However, none of these accidents proved to be serious, nor did they occasion any great delay, and it was indeed fortunate that none of them happened at a time when the safety of the ship might have been endangered had the engines failed for even a short period.

The last mail was sent ashore with the pilot at Father Point and the voyage may be said to have really begun. Fresh head winds in the vicinity of Anticosti gave everyone a good shaking up and sorted out the "sailors" pretty thoroughly from the "landlubbers." The strait of Belle Isle was entered on the evening

of July 26 and next day the *Arctic* was out on the Atlantic with numerous icebergs in sight. The course was set well to the eastward in order to avoid the bergs and field-ice brought down along the Labrador coast by the southerly current, and to enter as soon as possible the northerly current off the coast of Greenland which would assist the ship on her way to the extent of a knot, or a knot and a half an hour which, with the *Arctic* heavily laden as she was and able to steam only about three and a half knots per hour, was well worth considering.

Fair, though light, breezes aided the ship and the coast of Greenland was first sighted on August 2, Mt. Umelik, 4,710 feet in height, being identified by Captain Bernier, at 8 o'clock on that morning. The coast is very rugged in appearance with many small hanging glaciers on the hillsides and larger glaciers in the valley bottoms, some of them coming down apparently to the water's edge, while in the background, overtopping all, could be seen the dim outline of the ice-cap which covers all of Greenland, except a comparatively narrow strip along the coast. At the distance the vessel was then from the coast, forty-five miles, no vegetation was in evidence.

It is interesting here to note that a letter was sent afloat in a partially inflated pilot balloon by Major Logan. The balloon looked very weird as it drifted off to leeward, a six foot sphere at the mercy of the waves and winds. The letter, which was addressed to Major Logan's mother in Nova Scotia, was received by her in November, having been picked up by a fishing boat off the southerly part of Greenland and forwarded to Denmark on the mail steamer, and thence to Canada.

As the ship gradually worked her way northward along the coast, there was less and less darkness at night until in the latitude of Disko island, about 69 degrees north latitude it was quite light even at midnight. The loom of the ice of the "middle pack" too became increasingly more apparent as advance was made to the north. The ship's course was shaped so as to keep her about midway between this middle ice and the coast, as Captain Bernier did not anticipate being able to find a passage through to the westward until much farther north.

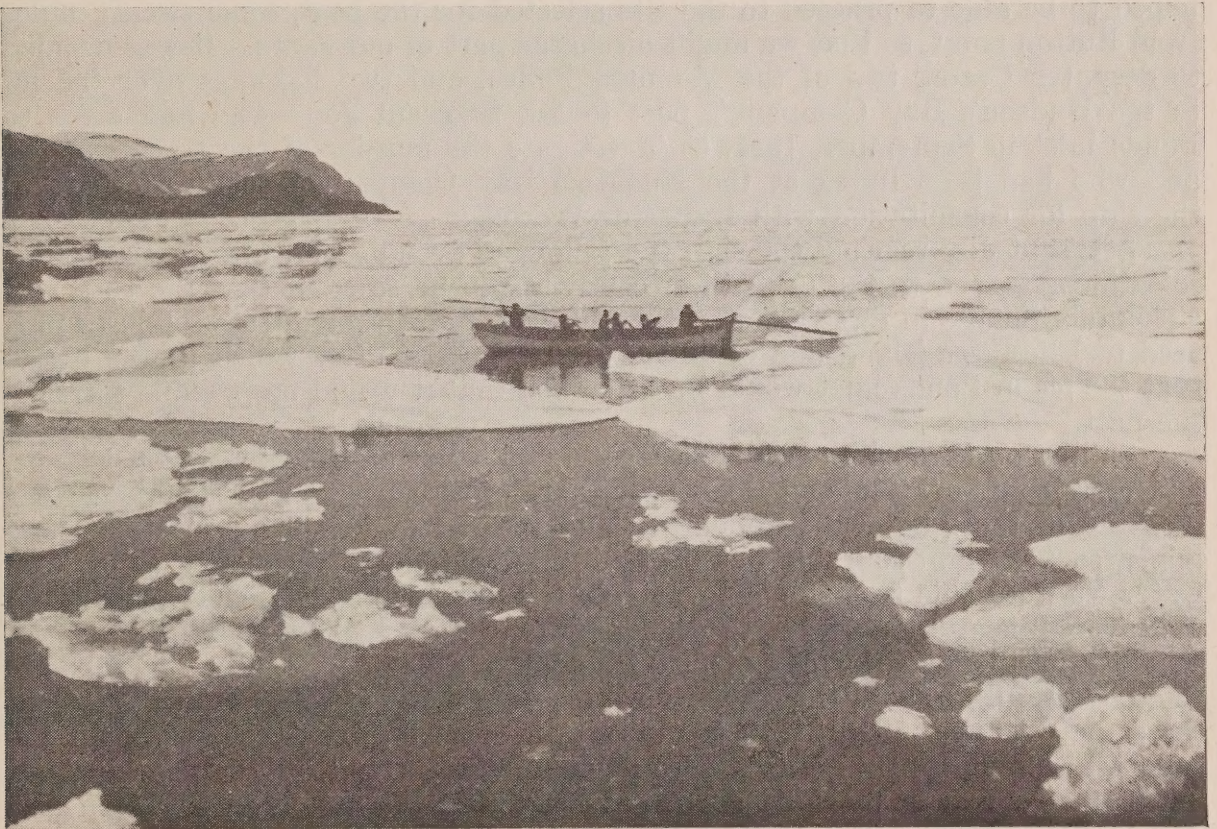
THREADING THE ICE FIELDS

This so called "middle-ice" consists of ice carried down from the north by the winds and currents, and from year to year, and even from month to month, varies greatly in extent, position and character. The name "middle-ice" is probably given to it because it is usually found about midway between the coasts of Greenland and Baffin island, though on the return voyage in September, nothing was seen of it as it had been, apparently, all driven towards the coast of Baffin island by the prevailing northeasterly winds. Smith sound discharges a great deal of ice into Baffin bay, and a large quantity of ice also results from the breaking away of the ice in Melville bay. These packs form the "middle-ice" and a number of attempts were made to get through it once a latitude had been reached where the Captain's experience led him to expect that a passage could be found. Many leads and lanes were followed up but all seemed to lead to an impasse until finally on August 11, he was forced to anchor to the ice in latitude $74^{\circ} 30'$ almost abreast of the Devil's Thumb, a well known landmark on the coast of Greenland.

Three days before this on August 8 there had already been a stop of several hours duration as the ship was unable to force her way further through the ice. Advantage was taken of the opportunity to make some minor repairs and adjustments in the engine room and to refill the fresh water tanks from one of the many pools of fresh water on the ice. The water in these pools is of a peculiar greenish shade and from the "crow's nest" can be easily distinguished from the pools of salt water.

Here while anchored to the ice, Doctor Livingstone noticed a bear, heading for the ship. Bruin had apparently observed it from a distance and was coming straight across the ice, swimming the intervening lanes of water as he came to them. Rifles were hastily brought out and after the bear had approached within about one hundred yards, a volley rang out which brought him down for a moment. Other shots followed and he was soon *hors de combat*. A canoe was despatched to tow him to the ship, where he was pulled out on the ice and his pelt, a not very valuable summer skin, was removed. For those who fancied it, his flesh made a welcome addition to the ship's larder. Several other bears were seen during the next few days but they were not so accommodating as this one and did not come within rifle shot of the ship and of course there was not sufficient time to go after them.

By 4 a.m. the ships tanks were nearly full, about 10,000 gallons of fresh water having been added to our supply. The repairs and adjustments to the engines and auxiliaries were completed shortly afterwards and the ship was on her course again by 6 a.m. Up to this time there had been only a few light



Arctic floe ice.

flurries of snow, but we now had a real snowstorm, about four inches falling on August 11 and making all realize that they were gradually getting north far beyond the limits of the temperate zone.

By the morning of August 13 the ice south of Melville bay, where the ship was held up, had been opened up somewhat by the tide, assisted by the influence of a gentle northeasterly breeze, and by the movements of two or three large bergs which, driven by some deep current, were eating their way through the ice-field off to the south and west. Following up a slowly opening narrow lane leading southwest, and breaking through into some other small patches of open water by charging the heavy ice at full speed, we were able to work our way two or three miles to the southwest. In the meantime the northerly breeze had freshened considerably, opening up the ice gradually, and by noon we had pro-

gressed so far that open water was plainly visible throughout 90 degrees on the western horizon, and much to the satisfaction of all on board, the ship could resume her course to north Baffin land.

PONDS INLET BLOCKED WITH ICE

After a pleasant passage across Baffin bay, Bylot island was sighted early on the morning of August 15, but it was evening before we got abreast of Button point, the southeasterly extremity of the island. Ponds inlet was found to be well filled with loose ice through which a whale boat could be seen working its way out towards the ship. Coming alongside it was found to be in charge of Mr. Wilfred Caron, Captain Bernier's nephew and agent here for Captain Munn of the Arctic Gold Exploration Company, and manned by an Eskimo crew.

They speedily came aboard and while the ship proceeded slowly up the inlet, a consultation in the chart room developed the fact that we were the first ship to arrive from outside, and that the ice was still solid from a point about seven miles farther up the inlet. This was a real disappointment as we had hoped to be able to proceed to the site selected for the post, some twenty miles from Button point, so that we might discharge part of our cargo. It was decided to despatch Caron, two of the Mounted Police, and two Eskimos over the ice to the Hudson's Bay Company's post to ask Sergeant Joy—who had come to Ponds inlet in September, 1921, to investigate the murder of the trader, Janes, and who had been living at the Hudson's Bay Company's post,—to come to the ship for consultation with Inspector Wilcox.

Sergeant Joy reached the ship the following evening and after a short consultation returned to the post, the ice proving to be so solid that the ship was absolutely unable to force her way through it. It was thought advisable to proceed to Ellesmere island and establish the post there, after which it was hoped that the ice in Ponds inlet would be so broken that it would be possible to reach the post.

Sailing northward along the east coasts of Bylot and North Devon islands, and crossing Lancaster and Jones sounds, Ellesmere island was sighted on the morning of the 20th, with Cobourg island abreast of us. Ice conditions here appeared very unfavourable but by taking advantage of various lanes of open water we were able to make our way into the passage between Ellesmere island and a small island named Smith island, off cape King Edward VII.

The northwest coast of Cobourg island was a beautiful sight. There were six glaciers, all of about the same width, of the same grade, and extending about the same distance inland, with the mountain spurs between them of about the same width. These six glaciers were flanked at either end by one narrower but much steeper glacier reaching down from the névés inland. North Devon also was very beautiful. The whole coast seemed to consist of alternate mountain spurs and glaciers, the latter reaching down apparently to sea level as no fore-shore was visible, due possibly to the fact that the *Arctic* was some 35 miles off shore. To the north could be seen Ellesmere island from abreast of Smith island to about cape Tennyson. In this distance there were three large glaciers, the most westerly being quite prominent. The glacier nearest the passage between Smith island and Ellesmere island we named Wilcox glacier. It is a narrow glacier which spreads out into a very regular fan shape before it discharges into the sea. There is also, farther to the east, an island which does not appear on any of the charts. Captain Bernier had never seen this part of the coast before as he passed here in 1908-9 during a heavy snowstorm. It is understood that Peary and Sverdrup passed along this part of the coast also in bad weather.

Just inside of Smith island our first "oogjook" or bearded seal was killed. There were also hundreds of small seal in sight and literally millions of water-fowl, principally little auks. Several bears too were seen on the ice during the

day while in the evening fourteen walrus were counted asleep on a pan of ice within one hundred yards of the ship. The doctor and two of the Mounted Police succeeded in shooting one walrus of another herd during the evening and this was hoisted aboard.

CRAIG HARBOUR SELECTED

Fram fjord had been tentatively selected as the site of the Ellesmere island post. From Sverdrup's description of the fjord, it seemed to have many of the qualifications desirable for a post, and we hoped to be able to reach it and to make an examination of it. The ice, however, was found to be solid for some miles outside the entrance to the fjord, and we were forced to abandon the attempt. The following day, the ice not having opened up at all during the night, we explored a small harbour just inside of Smith island, which was named Craig harbour by Inspector Wilcox and Captain Bernier, and in the afternoon sailed along the coast toward cape Tennyson, until again stopped by solid ice.



Royal Canadian Mounted Police buildings in course of erection, Craig Harbour, Ellesmere Island.

During this trip a sketch was made of the hitherto uncharted portion of the coast and Wilcox glacier, Cory glacier, and Stewart island were named, after Inspector Wilcox, Mr. W. W. Cory, Deputy Minister of the Interior, and Honourable Charles Stewart, Minister of the Interior.

Conditions for approaching Fram fjord proving to be no more favourable next day, it was rather reluctantly decided that we could delay no longer and that perforce, the post must be established at Craig harbour.

There followed eight days of feverish haste and almost unceasing work. Two years' equipment and supplies for seven men had to be taken ashore and sorted out, while living quarters and a storehouse had to be erected, or at least brought so far along toward completion that the police could with safety be left to their own resources.

The first to be taken ashore were Kakto and his family. This Eskimo and his wife and four children, the oldest a girl of eleven, had agreed to come up from Ponds inlet to stay with the police for a year. We had hoped to be

able to persuade two or three families to come north and settle around the post, but so many were absent from the inlet during our short stay there that this family came north alone. Kakto seems to be a good reliable Eskimo, with a fair knowledge of English and should be of great assistance to Inspector Wilcox and his men.

The harbour proved to be shallow and though anchored in only about seven fathoms of water, the ship was about one and a quarter miles from the landing place. This distance, even with launches to tow the small boats, took a considerable time to cover, and as laden boats could be taken to the landing place only at or near high water, the landing of supplies seemed to progress very slowly. The tides in the harbour were very strong, carrying in and out large quantities of ice, some of it comparatively small pieces which occasioned no worry, but some of it in such large masses that the anchor had to be hoisted,



Baffin land native family with skin tent.

and the ship kept under way, to dodge the ice. With most of the ship's officers and crew assisting with the unloading, practically all the responsibility for the ship rested on the Captain who, on one occasion, was continuously on duty for fifty hours without ever leaving the deck.

Craig harbour is about three miles wide at the seven fathom line where the ship was anchored, and about one and one-half miles wide at the head of the bay, the water shoaling very gradually towards the head of the bay. The valley is flat and low, with the foot of the glacier about two and a half miles from the shore line and apparently still receding. It is evident that it is many years since the glacier actually discharged into the waters of the bay.

From a short distance off shore an old shore line is quite apparent, showing that since some not very remote age, geologically speaking, the land has lifted, the elevation of the old shore line now being about forty to sixty feet. At the

same time there were seen, only some few feet above the present high water mark, the stone foundations of several old Eskimo igloos. From the condition of these ruins, and from the moss and lichens growing on them, they must be several hundred years old, so that the uplift of the land antedates that considerably.

The valley is surrounded by limestone-capped granite hills from 1,800 to 2,000 feet in elevation, cut into by many tributary valleys or draws, and it is quite apparent from the new appearance of much of the material at the mouths of these draws, that nature is still very busy in her many ways and that geologically speaking, the valley is still "young."

After going thoroughly over the whole valley, it was decided to place the buildings on the northwest side at the foot of the cliff and close to high water mark. This site gives good protection from northerly and northwesterly winds, ensures the best view out over Jones sound, and takes greatest advantage of the early spring and late fall sunshine.

The waters of the bay abounded in sea lice, or the "shrimps" on which Greely and his men lived for so long, and an occasional small fish, species unidentified, was seen. On shore no animal or bird life was seen although a couple of very old caribou horns were picked up, a fox track; and some rabbit traces were noticed and also a few musk-ox tracks. However, with the millions of little auks and other waterfowl just outside the harbour, and the numerous bear, walrus and seal in the bay between here and Fram fjord, there would appear to be no need for apprehension concerning the game supply. It is altogether likely that some of the valleys farther to the westward of Jones sound would also provide abundant game at certain seasons of the year, as from Sverdrup's descriptions they appear to be much more attractive than that in which the post was situated.

No grass was seen, and only one small piece of willow about one-quarter of an inch in thickness. The only vegetation here was moss and heather.

SITE FOR AIRSHIP LANDING

Major Logan was able to find a site sufficiently level and smooth for an aerodrome on the opposite side of the valley.

A plane-table and photographic survey was made of the valley and its vicinity, and a bronze tablet was set in solid rock, the markings of the tablet being "Canada, N.W.T. 1," signifying the first tablet set in Franklin district under the direction of the North West Territories Branch, Department of the Interior. Observations for latitude, longitude, and azimuth, were taken by Mr. Brown over this tablet with the six-and-a-quarter inch Berger transit; Major Logan also observing with his sextant and an artificial horizon.

The observations showed the post to be situated in latitude $76^{\circ} 10'$ north, and longitude $81^{\circ} 20'$ west of Greenwich.

On August 26 a scaffold on the Royal Canadian Mounted Police living quarters on which three men were working gave way, and Mr. Reilly, who was assisting the carpenters at the time, sustained painful internal injuries in the fall. He was transported to the ship on an improvised stretcher, suffering considerably, and spent practically the entire remainder of the voyage in bed in the chart room, being able to come out on deck with the aid of crutches only a few days before the ship reached Quebec.

On August 28, all equipment and stores were ashore and it was decided that if the weather held favourable, we would remain a few days to assist with the buildings. That night, however, the bay filled with very heavy ice and a bad snowstorm came on, and as from one to three inches of ice had been forming in the harbour each night, Captain Bernier decided that winter in the harbour was too close at hand to take any further chances, and, picking up the last

mail and saying the last farewells to our fellow passengers, Inspector Wilcox and six of his men, we steamed out of the harbour shortly after midnight.

It must be admitted that the inspector looked rather forlorn going ashore in our launch in the dusk, with so much snow flying that the shore was entirely invisible, and the harbour full of running ice. However, having made arrangements for a system of communication by smoke signals as soon as the ship came in sight next year, we began our return journey, having established the most northerly post office in the world, with the possible exception of one on the island of Spitzbergen. This new outpost of Canadian civilization, consisting officially of a police post, customs house and post office is only slightly more than eight hundred miles from the north pole.

Working our way southward through much loose ice, we again skirted the east coast of North Devon island, and having rounded cape Warrender, spent part of a day making, at the request of Inspector Wilcox, an examination of Dundas harbour, with a view to establishing at some future date a headquarters post there for the north. The harbour is some four or five miles long by about one and one-half miles wide, and is almost completely landlocked. At its southeastern corner is a good site for the post, well sheltered from winds and sea, and with a good anchorage close by, while from a small hill nearby a commanding view may be had of Lancaster sound.

Leaving Dundas harbour, an attempt was made to reach Ponds inlet by going down through Navy Board inlet to the westward of Bylot island, and thence through Eclipse sound. Reaching Canada point, however, solid ice was seen ahead and we were forced to go around Bylot island to the eastward. To our great disappointment Ponds inlet was found to be still full of ice, though it had been broken somewhat since our first visit. The ship was able to work her way almost up to the post, but a change in the tide swept the ice back through the inlet and we were obliged to enter Albert harbour for shelter. This is situated on the north coast of Baffin island about ten or twelve miles east of the Hudson's Bay Company's post. Sergeant Joy had, however, been able to board the ship by small boat while we were near the post and he remained on board as our guest until we left for the south.

We took advantage of our three days stay there to load about one hundred and twenty tons of stone for ballast, being assisted in this by several Eskimo. About twenty-five tons of coal also were landed here to save time later or should unloading prove to be difficult at the post, and in addition, a photographic survey of the harbour was made by Mr. Brown and his assistants.

In the harbour for part of this time Captain Munn's ship the *Albert* was with us, and after his departure, the *Bayeskimo*, the Hudson's Bay Company's supply ship, arrived.

PONDS INLET REACHED AT LAST

The *Arctic* and the *Bayeskimo* were able to reach the post on September 6 and anchored in a temporary harbour formed by a large pan of ice held back by an iceberg grounded in the shallow water off the post. The weather was very favourable and considerable material was sent ashore during the day. A beginning was made on the Mounted Police living quarters, much more rapid progress being made than at Craig harbour owing to the experience gained there, and owing to the fact that the workers had the assistance of several Eskimo.

About 5 p.m. with nearly every one ashore working, a large pan came drifting down with the change of tide, and after the sharp peremptory barks of the whistle had recalled the shore party to the ship we hoisted anchor and made for more open water, farther from shore and correspondingly safer, the *Bayeskimo* doing likewise.

That night proved to be a bad one, a heavy wind accompanied by driving snow entirely cutting off all chances of seeing the land, while the ship was almost completely at the mercy of the rushing ice pans. With the approach

of daylight, however, and the change of the tide, the weather cleared and the ship again anchored off the post and unloading was resumed. The time was seen to be so short, however, that even those of the technical personnel, who could be spared, acted as stevedores, while Captain Bernier, to release a man for other duties, acted as winchman.

The last loads were sent ashore about 4 p.m. and almost immediately thereafter the anchor was weighed and the ship had to move out on account of the ice coming in, as before, under the influence of the tide. We were able to get somewhat closer to shore later on in the evening, and received the last letters, and said farewells; then about 9 p.m. with three long blasts of the whistle, which started all the dogs in the village howling, the *Arctic* began to force her way eastward out of the inlet towards the open sea and home.



Hudson's Bay Company post at Ponds Inlet.

During our short stay the carpenters had made good progress with the house, but it was not nearly complete. There was no hesitation in leaving the police, however, as they would be able to get assistance here both from the Eskimos and from the Hudson's Bay Company.

As at Craig Harbour, a bronze tablet, No. 2, was set in a large boulder behind the Mounted Police buildings, indicating that the official survey starts at that point. Owing to our short stay there, however, it was possible to do only the preliminary work comprising phototopographic surveys in the vicinity of the post and some triangulation.

Affairs in this district were found to be in very capable hands, under Sergeant Joy's charge. He had come here by the Hudson's Bay Company's boat in 1921 to investigate the murder of the trader Janes, who, it was alleged, was killed by Eskimos to the westward of the inlet. He had gone after the body and after great difficulties and hardships, had found it and brought it to the inlet where he held an inquest. He then put three Eskimos under arrest and sum-

moned several others as witnesses. It is expected that as a result a court will be sent north in 1923 to adjudicate on the case, so that the Eskimos may see that Canadian laws must be respected and may learn to expect justice in all their dealings with the white men, and to appreciate the fact that white men will be punished just as Eskimos will be for any wrong doing.

Captain Munn, on his arrival from Cumberland gulf, reported that a fanatically religious Eskimo there had run amuck and had killed several of his neighbours. These murders will probably be investigated at a later date.

Twenty-four hours of continuous effort working through the ice brought us to open water inside of Button point, some of the ice, particularly off Brodeur



Native women, Baffin Land.

island (Albert harbour) being very solid and on one or two occasions requiring repeated charges by the ship at "full speed ahead."

Contrary to expectations, no "middle ice" was seen while crossing Baffin bay, the probable explanation being that it had been driven towards the southeasterly coasts of Baffin island by the almost continuous northerly and northeasterly winds of the preceding two or three weeks.

VISIT PAID TO GODHAVN, GREENLAND

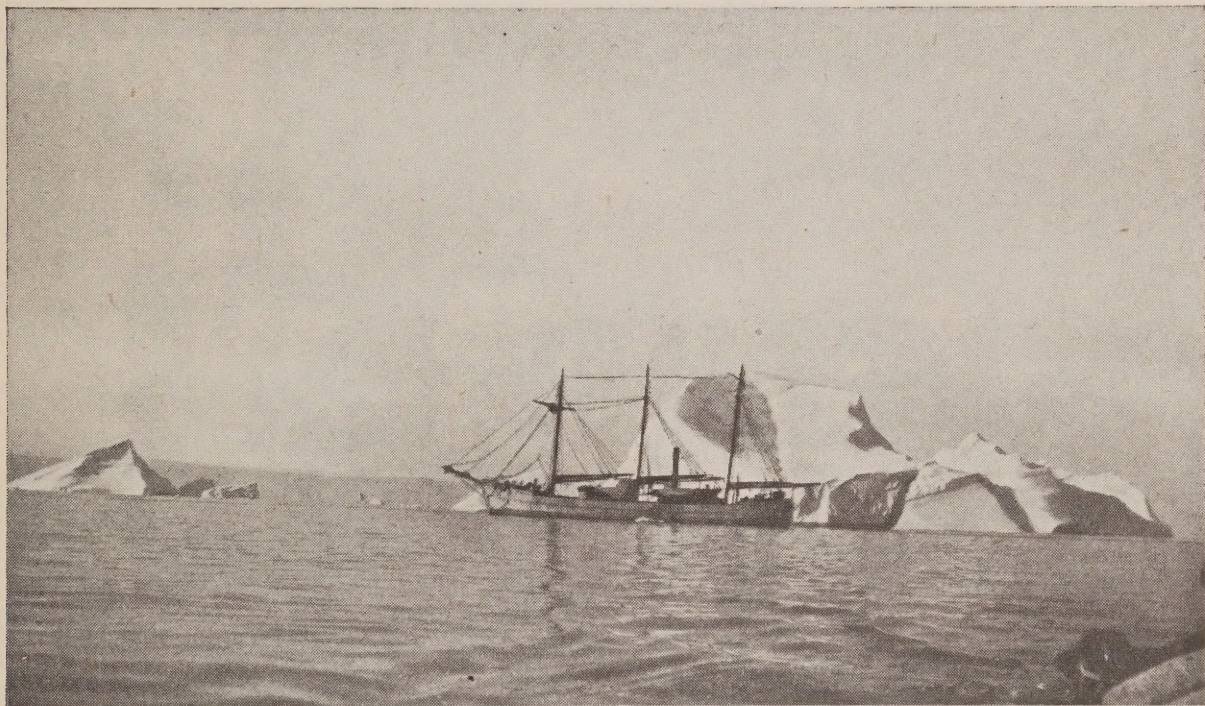
After a good passage across the bay, the ship arrived off Godhavn, Disko island, Greenland, early on the morning of September 13.

Inspector Wilcox, being unable to procure either dogs or Eskimo boots (kamiks) at Ponds inlet, had asked us to call at Godhavn on our return trip to endeavour to arrange for a supply of these to be called for by the ship on her way north in 1923. His letters from the Danish authorities, granting permission to land and to make purchases, he had handed to us, and after the ship had been visited by some Eskimos in kayaks, who offered to pilot us into the inner harbour, we went ashore in our launch and presented our credentials and letters.

We were warmly greeted, first by Dr. Porsild, scientist in charge of the experimental station at this point, and by his son, the assistant scientist. Dr. Porsild, who speaks perfect English, explained that the District Inspector was absent at the time, and that he himself was just on the point of leaving in a

launch to take the mail across the sound to a steamer which was ready to leave for Denmark. He introduced us to Mr. Neilson, the Government agent, who was kindness itself. Although he does not understand or speak English as well as Dr. Porsild or his son, we were easily able to make him understand our needs and he explained that, although in all probability the Godhavn settlement itself could not spare the dogs and boots the Police wanted, he had no doubt that they could be collected from some of the other settlements, and that he would be glad to have us call for them in 1923.

Only about two hours were spent ashore but the visit though brief, was most interesting. The settlement is indeed an oasis in the desert. The houses, particularly some of those occupied by the Government officials, are very attractive and quite pretentious, being built of lumber imported from Denmark and are nicely painted in red with white trimmings. Neat, clean, well laid out paths lead from one point to another in the settlement, with quite



Steamer "Arctic" passing an iceberg in Baffin Bay.

large warehouses in the vicinity of the landing place. The Government scientific station and the residence of Dr. Porsild are situated across the harbour, unfortunately for us, too far away to be visited in the short time at our disposal.

We appeared to be a source of great interest to the inhabitants of the village, as they certainly were to us. Mr. Neilson informed us that the *Arctic* was the first foreign ship to visit the port for some years.

Most of the men of the settlement were apparently absent from the village, probably engaged in their regular pursuits, but the party was enthusiastically welcomed by those who happened to be home, as well as by the women and children. The natives, or Greenlanders, as they prefer to be called, seemed to be happy and prosperous, and all appeared to be clean, and well and comfortably dressed, some of the women even donning their holiday attire in honour of the visit. These natives, judging from their features and build, seemed to be of all types from pure Eskimo to almost pure Scandinavian, the result no doubt of the many years, one might even say centuries, of contact, first with the old Norsemen, and later with the modern Danes. The population of Greenland, we were informed by Mr. Neilson is about 13,000, of whom some 300 to 350 are Danes.

The women's dress was particularly attractive and sensible. They wore a smock of heavy linen or cotton, generally in a checked pattern, and lined usually with very heavy red flannel. The wide neck and the sleeves were trimmed with fur, or plush, sometimes with touches of embroidery on white linen. They wore no skirts, only short neatly fitting sealskin breeches, decorated with what, at first sight, appeared to be bead work, but which was really a pattern made by sewing on to a strip of leather numerous minute brightly coloured pieces of thin leather in a pattern. The amount of patience necessary for some of the more elaborate of these decorations must be very great. We were informed that the natives themselves have been taught by the Danes to tan and dye their own leather for this purpose, and also to make the long varicoloured boots (kamiks) which complete the summer costume. These boots are very neatly made, being of course hand sewn, with waterproof soles



Greenland natives, women and children in summer dress, Disko Island, Greenland.

of "oogjook," or bearded seal, and are worn over a lining or stocking of sealskin, with the foot of caribou or baby musk-ox, the fur being worn next the skin, and the stocking being finished off at the top, when it comes outside the breeches, with a band of fur, plush or of finely embroidered linen. The boots themselves are of various colours, dark blue, purple, bright red and some of them pure white. The leather is soft and pliable, and the finish indicates a high degree of skill in tanning and dressing. The boots also are decorated with strips of the same fine coloured leather work as used on the breeches.

In one of the other settlements, Godthaab, farther to the south, the natives have their own newspaper in their own language, all the work in connection with the printing, editing, and publishing being done by themselves. They have also, we were told, their own photograph galleries. The Danes, in short, seem to be devoting a great deal of time and energy towards making the natives self-supporting and self-respecting. The scientific stations, for there are others besides that at Godhavn, were established and are maintained by the Danish Government, solely for the purpose of carrying on investigations for the benefit

of the natives, such for instance as ascertaining what vegetables, if any, can be made to grow at the various stations, and how best to treat the skins for export, and other similar problems. The natives are being taught the value of export trade and are being encouraged in making articles suitable for sale elsewhere, and in turning out products that will have a commercial value. Their principal trade is in furs, skins, fish, and oil. About 30,000 sealskin, 11,000 barrels of blubber, chiefly seal, and about 3,800 barrels of sharks' livers are bought annually from the natives, also 1,500 white and blue fox skins, a few bear skins and a little eider-down. The catch of white whales and narwhals has fallen off so considerably that it is unimportant, and very few reindeer skins are now obtained, though these formed a few years ago one of the chief articles of export. The quality of fox skins has also deteriorated considerably.

After a couple of hours ashore, the Commander invited Mr. Neilson and Mr. Porsild out to the ship for lunch and they gladly accepted. After meeting Captain Bernier, they were shown over the ship and expressed themselves as astonished at the completeness of her equipment and her comfortable interior arrangements, though they did not seem to be particularly impressed by her exterior appearance, her sides being badly scraped by the ice and showing in many places the red paint of her body as when painted for lightship duty, and her spars and sails being almost black from the smoke of the soft coal we had been burning.

They were intensely interested in the wireless equipment, and looked over with evident appreciation our file of daily bulletins of world news, provided by our wireless operator.

Shortly after lunch our visitors departed for the shore and with a salute of three long blasts of the whistle, the *Arctic* was once more on her way on the last "leg" of the voyage, the Captain holding a course well to the westward so that we might get clear of the northerly current along the coast before heading south, which he did when we had reached longitude 57 degrees west.

At 8 p.m. on September 14 we crossed the Arctic circle, and, as on the northerly voyage, the Captain at dinner paid tribute to Father Neptune in a few well chosen words, the crossing of the "Circle" here being an occasion somewhat similar to the crossing of the "Line" at the Equator.

After a good trip south the *Arctic* ran into heavy head winds in the vicinity of Belle Isle and was unable to enter the strait until the evening of September 23. Except for further fresh head winds in the vicinity of Anticosti, the trip up the gulf and river to Quebec was uneventful and, picking up the pilot at Father Point, the ship reached Quebec on the afternoon of October 2, having been delayed somewhat by the smoke of the forest fires raging at various points in the townships south of the river.

RESULTS OF THE TRIP

The net results of the trip may be briefly enumerated. Police posts, post offices, and customs houses had been established at two points, Craig harbour, Ellesmere island, and Ponds inlet, Baffin island.

The post at Craig harbour is a double post, that is, there are there an Inspector of Police, in charge of the district, a corporal and five men. This is actually the personnel of a central headquarters post which, it is hoped, will be established elsewhere in 1923, when Craig harbour will become a sub-post with probably three men as its staff.

At Ponds inlet a sergeant of the police had been quartered with the Hudson's Bay Company for a year investigating, as above mentioned, the murder of a trader named Janes. He was reinforced by a corporal and two men, and material was landed to erect a police living quarters and storehouse, as well as supplies and equipment for two years.

Dundas harbour, in the south coast of North Devon island, was visited as already stated and examined with a view to its suitability as a site for a headquarters post.

Our ability to get time accurately by wireless enabled us to check the positions of several points on the charts and enough evidence was secured to show that the existing charts are seriously in error in many places, due probably to the fact that the clocks or chronometers of the old explorers were incorrect, there having been no possibility in some cases of checking them for periods possibly as long as two or three years, depending upon the length of their voyage. These charts should be revised.

The observer of the Air Board accompanying the expedition secured valuable data, his conclusions in brief being that there are many places in the Archipelago suitable for the erection of aerodromes and the construction of landing places, thus obviating the necessity of using hydroplanes in the north, an exceedingly dangerous operation over waters apparently clean and open, but necessarily containing many pieces of small ice, difficult to "spot" from a rapidly moving plane.

His conclusion was that the weather during the latter days of May, and in June, July and part of August, appears to be almost ideal for aviation, the twenty-four hours of continuous daylight making conditions particularly favourable. It may be easily seen that a very large amount of patrol and survey work could be done during this period.

His recommendation is that an experimental air station, equipped with two small machines, and with a personnel of two pilots and two mechanics, should be established at some central point such as Ponds inlet and maintained throughout a year so that information might be obtained by actual observation covering a longer period than merely the few weeks occupied by a voyage such as that of last summer.

Phototopographical surveys were made of Craig harbour, Albert harbour, and Ponds inlet, and a moving-picture panorama was secured of Dundas harbour.

Although the Government has intimated that additional posts will be established, it is as yet undecided exactly where they will be placed. There is need for one at Cape Sabine, on the east coast of Ellesmere island, and it is expected that an effort will be made to establish this in 1923. It is reported, however, that no boats were able to get north of Cape York last season. If similar conditions continue this year, it may prove more convenient to establish the headquarters post already referred to possibly at Dundas harbour, as Lancaster sound is known to open early and to remain open until a fairly late date. There would appear to be need for a post, say next year, somewhere farther to the westward, possibly on Bathurst or Melville island.

The necessity for police supervision is shown by the Janes murder case and by the reported murder last year at Cumberland gulf of five natives by another member of the tribe.

Besides the Hudson's Bay Company, there are other traders at various points, and there are, almost every season, expeditions both British and foreign, so that it would seem most advisable to have the Government represented on the ground by the Royal Canadian Mounted Police, who may always be relied upon to see that law and order are maintained and that every one gets a "square deal."

The possibilities of the country are great in many ways and it only remains for the Government to continue to show its interest in it by establishing and maintaining these posts, when the resulting increased knowledge concerning the regions will stimulate additional interest by private individuals and corporations, and a natural healthy development will speedily follow and undoubtedly result in a great, and much needed, improvement in the general living conditions of the present population.

APPENDIX

AVIATION IN THE ARCTIC

A Reconnaissance of Flying Conditions in the Eastern Arctic Archipelago, 1922.

BY MAJOR R. A. LOGAN, *Department of National Defence, Canada*

During the past few years many changes have taken place in the method of travel and transportation in all parts of the world, and as the North West Territories cover a very wide area, transportation is one of the greatest problems in exploring and developing the resources of that part of Canada.

One of the latest methods of travel being the employment of aircraft, it was considered advisable to investigate conditions affecting aircraft operations



828 miles from the pole.

in the northern part of the territories by sending an experienced air pilot to accompany the expedition to the Northern archipelago on the C.G.S. *Arctic* during the summer of 1922.

Through the co-operation of the Air Board, the writer who was attached to the Canadian Air Force, was released from duty at Camp Borden, Ontario, and was attached for about five months to the North West Territories Branch, Department of the Interior. During this period he was a member of the expedition under the command of Mr. J. D. Craig, D.L.S., and visited various points in the Arctic islands extending as far north as latitude 76 degrees 20 minutes or about 820 miles from the pole. On his return he made a report of his investigations on which the following is based.

The *Arctic* left Quebec on July 18, 1922, and proceeding via strait of Belle Isle to the west coast of Greenland, followed the coast northerly to latitude 74 degrees in order to pass around the north end of the ice fields which cover hundreds of square miles of the waters of Baffin bay. After several days of zig-zagging through the ice fields Button point, on Bylot island, was reached on August 15, 1922.

The intention was to visit the settlement at Ponds inlet, but owing to the ice still blocking the inlet it was found more advisable to proceed first to Ellesmere island and on the return to call at Ponds inlet in the hope that by that time the ice would probably have drifted out.

The ship proceeded north to the vicinity of Fram fiord, on Ellesmere island with the object of establishing a police post somewhere in the neighbourhood. Owing to the exceptionally mild summer there had been no heavy seas to break up the ice, which consequently blocked nearly all the inlets. Fram fiord being one of these, it was decided to establish the post in a small bay named Craig harbour.

Several days were spent here in investigating local conditions, both upon the low land, at the head of the bay, and on the tablelands in the interior of the island. The best site for an aeroplane landing-ground on the lowland was surveyed, and marked by leaving a Canadian Air Force ensign. After the duties of the expedition were completed at Craig harbour the ship proceeded to Dundas harbour, on North Devon island, where opportunity was also taken to observe local conditions and to investigate the possibility of utilizing any of the adjacent area as landing grounds for aircraft.



Craig Harbour, Ellesmere Island.

On the return voyage a visit was paid to Navy Board inlet and the entrance of Ponds inlet was reached again on September 2, but the ice was still too thick to permit the ship to reach the settlement until four days later. Here an aerodrome was surveyed and marked on the ground and local conditions were investigated as far as time would permit. The ship returned to the south calling at Disko island, Greenland, en route, and reached Quebec, October 2, 1922.

Though the season for actual investigation was very short, it has been made clear that the possibilities are such that a more thorough investigation should be carried out by extending the period of actual residence to at least one year, in order that investigators may see the country at various points, not only at its best, but also at its worst.

As the information which the general public has regarding the north country is at least one hundred years old, the impression prevails that the North West Territories are just mounds of snow and ice sticking up above the polar sea. If one read only books of such a date regarding the parts of Canada we know, especially the Prairie Provinces, he would get an impression very different from

fact. The natural resources lie there unknown and just as the railway hastened the development of Western Canada so may aircraft aid in the north.

It may surprise many people to realize that two thousand miles north of Ottawa the general climate of the winter season is no more severe than in many of the more northerly settled parts of Saskatchewan and Manitoba, and that there are hundreds upon hundreds of square miles of land bare of snow in summer, covered with beautiful flowers, grass and moss supporting innumerable animals including caribou, musk-ox and foxes, while there are immense areas of coal and indications of many other minerals.

As the interior of the islands is practically unknown and even the coast-line only very roughly sketched in on the charts, aircraft can serve a very useful purpose in connection with surveying and exploring the country. Its other uses will be in the transportation of men and material, where other means would entail much time, expense and hardship. Aircraft may also be used to great advantage as an assistance to marine navigation in locating open water and ice fields. In general it may be said that aircraft in the form of aeroplanes equipped with skis, and with sufficient protection for engines may be used for the greater part of at least five months of the year.

Conditions affecting other sciences such as wireless and photography which are used in connection with aircraft were found to be very favourable. By means of a small portable wireless set weighing only a few pounds signals were received from Panama, Berlin, France, and many intermediate points, and all indications pointed to very favourable conditions for all wireless reception.

While certain conditions affecting aircraft operating in the Arctic archipelago are distinctly different from those prevailing in parts of Canada where flying operations have also been practicable during five months of the year, conditions in these parts of the Arctic are favourable for long cross-country flights, in so far as frequent landing places are concerned, and this during the season of the year most suitable for survey work and investigation of the natural resources of the country.

